FACT SHEET FOR NPDES PERMIT
NO. WA-005213-2

COMMUNITY OF BUENA POTW

DATE OF THIS FACT SHEET - JULY 31, 2006
DATE OF EXPIRING PERMIT - AUGUST 31, 2011

SUMMARY

Yakima County is seeking the reissuance of the Community of Buena's National Pollutant Discharge Elimination System (NPDES) wastewater discharge permit. The unincorporated Community of Buena is located in the lower Yakima River Valley, approximately 18 miles southeast of the City of Yakima. The treatment plant was constructed in 1993, and expanded in 2000.

The facility's 2005 NPDES application listed a total population served of 1,126 served by the wastewater treatment plant. There are only a few, small commercial businesses in the community.

The wastewater treatment system consists of septic tanks located at each residence that provide partial treatment of the effluent. The wastewater flows from the septic tanks by gravity to the treatment plant where two recirculating gravel filters provide biological treatment of the effluent. Ultraviolet lamps then disinfect the wastewater, prior to discharge to an unnamed waterway. This waterway flows a short distance, under Interstate Highway 82 into a natural channel in the Yakima River flood plain. The floodplain channel has a confluence with the main stem of the Yakima River approximately 3,000 meters to the southeast.

The proposed permit requires the submittal of a Water Quality Evaluation in order to more fully understand the impact of the facility's discharges on the receiving water. The evaluation is to be conducted according to guidelines established by the Department of Ecology for Quality Assurance Project Plans.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Yakima County Public Services
Facility Name and Address	Buena Publicly Owned Treatment Works
Type of Treatment:	Recirculating Gravel Filter with ultraviolet (UV) disinfection
Discharge Location	Unnamed waterway, tributary to the Yakima River, at river mile 91.7 Latitude: 46° 25' 01"N Longitude: 120° 19' 00"W (WGS84/NAD83)
Water Body ID Number	WA-37-1020

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

History

Yakima County Public Services owns and operates the treatment plant. The County initiated the design and construction of the original treatment plant in the 1989 to 1993 time frame in response to failing septic drainfields in the Community of Buena. Prior to construction of the treatment plant, some shallow drinking water wells in the area were contaminated with improperly treated wastewater. Operation of the original septic tank effluent gravity system with a one-cell recirculating gravel filter (RGF) wastewater treatment plant began in August 1993. The wastewater treatment plant design capacity was essentially doubled with an additional RGF filter bed in 2000.

Collection System Status

The septic tanks are concrete or fiberglass and are equipped with fine screens incorporated into the tank's effluent outlet. The sewer system is PVC pipe with plastic lined manholes and sealed covers. The collection system is a straight grade sewer, utilizing six and eight-inch sewer pipe that route septic tank effluent to the RGF by gravity.

The system has been routinely examined for infiltration and inflow sources in the past and these flows have been largely eliminated.

Yakima County has a sewer ordinance codified in Yakima County Code: Chapter 12.05 SEWER SYSTEM.

Treatment Processes

The treatment of wastewater at the Buena wastewater treatment plant (WWTP) consists of three primary units: 1) the septic tanks or Septic Tank Effluent Gravity system (STEG) where the pollutant load is substantially reduced, 2) the recirculating gravel filter (RGF) where the effluent receives further pollutant reduction, and 3) ultraviolet disinfection.

The system has over 200 septic tanks (owned and maintained by the County), located at each residence in the community. In a STEG system grease and solid materials in the wastewater are, to a great extent, separated out at each septic tank. Anaerobic bacteria digest organic compounds in the septic tank. Approximately two-thirds of the 5-day biological demand (BOD_5) and Settable Solids are removed in the tanks.

Typical effluent concentrations from septic tanks equipped with effluent filters range from 100 to 140 mg/L for BOD_5, 20 to 55 mg/L for Total Suspended Solids (TSS), and 10 to 20 mg/L for Fats, Oils, & Greases (Crites and Tchobanoglous, 1998; Stuth, 2004).

The septic tanks are connected to each house or business by a standard 4-inch sewer pipe. A small-diameter (approximately 2-inch) service lateral on the homeowner's property conveys the septic tank effluent to the STEG main sewer pipe.

At the treatment plant's RGF, influent from the septic tanks first passes through a Parshall flume with an associated ultrasonic level transmitter where the volume of the wastewater is determined. An influent composite sampler is located above the Parshall Flume chamber.

The RGF's provide biodegradation or decomposition of wastewater constituents by bringing the wastewater into close contact with a well developed aerobic biological community attached to the surfaces of the filter media. The media is similar to pea gravel. The gravel media is contained in two 12,000-square-foot concrete filter beds, which are 5-feet deep. Proper function requires that influent to the filter be distributed over the gravel media in frequent, cycled uniform doses. In order to achieve accurate dosing, these systems require a timer controlled pump with associated pump chambers, electrical components and distribution network. This frequent, cycled dosing provides a constantly wetted media, while at the same time allowing aerobic conditions to persist. A flow splitter box is used to control recirculation. The effluent is collected in the bottom of the filter and a fraction of the volume (approximately four-fifths) returned to the recirculating/mixing tank where it mixes with fresh septic tank effluent. The remaining fraction (approximately one-fifth) of the effluent is routed through the Ultra-Violet disinfection chambers prior to discharge through the outfall.

Standby power for the treatment plant is provided by an 80 kW diesel powered generator.

Discharge Outfall

Secondary treated and disinfected effluent is discharged from the facility via a pipe into an unnamed waterway, which is at least partially, an irrigation return. From the outfall, the waterway flows through a culvert under Interstate Highway 82, and then approximately 3000 meters southeast via a natural flood plain channel to the Yakima River at river mile 91.4.

Residual Solids

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 173-308 WAC, "Biosolids Management". The management of other solid waste is regulated by local jurisdictional health departments through local ordinances and WAC 173-350 and WAC 173-351.

Septic pumpers are contracted by Yakima County to remove solids from the treatment system's septic tanks. This septage is sent to the County's septage lagoon at the Cheyne Landfill for further treatment. Biosolids sludge removed from the recirculation tanks is directly applied as a beneficial use at the Cheyne Landfill. These residual wastes are applied as a beneficial use at Yakima County's Cheyne landfill under permit from the Yakima County Health District.

The facility received coverage under the State's Biosolids General Permit in April 2006.

PERMIT STATUS

The previous permit for this facility was issued on January 24, 2001. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and Ammonia.

An application for permit renewal was submitted to the Department on September 21, 2005 and accepted by the Department on November 10, 2005.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on March 9, 2006.

During the history of the previous permit, the Permittee has remained substantially in compliance with its permit limits, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

INFLUENT CHARACTERIZATION

Loadings to the POTW were reported in DMRs submitted to the Department and are compared with the applicable design criteria in Table 1. It should be noted that the influent to the

recirculation tanks has received initial treatment in the septic tanks. Therefore, the influent's pollutant concentrations are substantially reduced from typical untreated residential wastewater.

Table 1: Influent Characterization

Parameter	3-year Characterization		Design Criteria
	Average	Highest Monthly Average	Monthly Average for the Maximum Month
Flow (MGD)	0.072	0.087	0.12
BOD_5, in mg/L	99.3	129.2	not applicable
BOD_5, in lbs/day	58.6	73.4	214
TSS, in mg/L	33.8	53.5	not applicable
TSS, in lbs/day	20.2	33.1	126
Ammonia, in lbs/day	19.4	35.6	not applicable

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized from three years of discharge monitoring reports as follows:

Table 2: Effluent Characterization

Parameter	3-year Characterization			Existing Permit Limits	
	Average	Highest Monthly Average	Maximum Weekly	Monthly Average	Weekly Average
BOD_5, in mg/L	5.9	12.5	22.3 [a]	30	45
TSS, in mg/L	7.3	34.9	42.2 [a]	30	45
Fecal Coliform Bacteria, in #colonies/100 mL	6.2	50	not determined	200	400
Ammonia, in mg/L	0.6	1.1	3.6	3.1	no limit

[a] Value represents the 99th percentile concentration of 3 years of weekly sampling with one outlier data result removed utilizing the Grubb's test method for outlier identification.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water

quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the March 1999 Engineering Report for Buena Wastewater Treatment Facilities Expansion prepared by the Yakima County Public Works Department and are as follows:

Table 3: Design Standards for the Community of Buena WWTP

Parameter	Design Quantity
Monthly average flow (max. month)	0.12 MGD
BOD_5 influent loading	214 lb./day
TSS influent loading	126 lb./day
Nitrogen influent loading	40 lb./day

The facility's 2005 NPDES application listed a total population served of 1,126 utilizing the wastewater treatment plant. This contrasts with the 1999 application which lists a population served of 700, indicating a steady population growth through the intervening period.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, Fecal Coliform, BOD_5, and TSS are taken from Chapter 173-221 WAC:

Table 4: Technology-based Limits

Parameter	Limit
pH	Shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD_5 (concentration)	Average Monthly Limit = 30 mg/L Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit = 30 mg/L Average Weekly Limit = 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

The monthly BOD_5 and TSS effluent mass loading limits (lbs/day) were calculated as the maximum monthly design flow 0.12 MGD) x Concentration limit (**30 mg/L**) x 8.34 (conversion factor) = mass limit **30 lb/day**.

The weekly average BOD_5 and TSS effluent mass loading limits were calculated as 1.5 x monthly loading = **45 lb/day**.

WAC 173-221-040 Domestic wastewater facility discharge standards require that the influent's BOD_5 and TSS concentration be reduced a minimum of 85% prior to the discharge of effluent to a receiving water. The septic tanks in a STEG/RGF system remove a substantial proportion of the influent BOD_5 and TSS concentration and mass loading. However, the exact amount of pollutant concentration reduction by each septic tank is not feasible to determine. (Historically, the RGF has removed at least 85% of the BOD_5 / TSS received from the septic tanks.) Therefore, the Permittee will be presumed to be in compliance with the percent removal requirement in the permit if the permit effluent concentration limit is met and there is no excessive inflow and infiltration (I/I). Infiltration is excessive when the highest 7-14 day average

daily dry weather flow is greater than 120 gallons per capita per day. Inflow is excessive when the highest recorded daily flow during a storm event is greater than 275 gallons per capita per day or when hydraulic overloading of the treatment plant occurs.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

The proposed permit relies upon critical condition information given in the existing permit. The critical condition data is based upon a receiving water study conducted by the Permittee from August 1994 through July 1997. The existing permit gives the creek's ambient Dissolved Oxygen levels as 3.9 mg/L, Ammonia at 0.21 mg/L, and a pH range of 6.3 to 7.7.

The existing permit required that the Permittee conduct a receiving water study for a one year period, July 2003 through June 2004. The receiving water was to be sampled twice monthly for flow, temperature, and pH. The Permittee's conducted the sampling on 10 occasions through the summer of 2005. The study recorded a temperature in the creek of 22 C° twice. The time of day the sampling was conducted was not given in the monitoring report.

The data received by the Department in these two monitoring reports do not meet the standards given in the State's 2004 Water Quality Data Act, codified in RCW 90.48.570 through 90.48.590. These principals are elucidated later in this fact sheet. The proposed permit requires that the Permittee conduct a Water Quality Evaluation, in order to determine the Critical Conditions of the receiving water. The evaluation will determine if the wastewater discharge protects the aquatic biota, and beneficial uses of the waterbody.

Mixing Zones

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. The requirements and Ecology's actions are summarized as follows:

1. The allowable size and location be established in a permit.

This permit specifies the size and location of the allowed mixing zone.

For this discharge, the percent volume restrictions of the Water Quality Standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated at a seven-day, consecutive low flow (as determined in the existing permit) with a ten-year return frequency (7Q10) was used to determine reasonable potential to exceed water quality standards, and the edge of the approved mixing zone.

2. Fully apply "all known available and reasonable methods of treatment" (AKART).

The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet.

3. Consider critical discharge condition.

The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.

4. Supporting information indicates the mixing zone would not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.

The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location.

The proposed permit relies upon receiving water data from a receiving water study conducted from August 1994 through July 1997. Given the time elapsed since the previous study, and uncertainties of the methodologies employed in gathering the previous data, the proposed permit requires a receiving water study based on a Quality Assurance Project Plan (QAPP).

5. Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.

A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for ammonia to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants shall be minimized.

The size of the mixing zone has been minimized by using the design criteria and the 7Q10 flow to determine the dilution factors. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.

7. Maximum size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone.

A. Acute criteria met as near to the point of discharge as practicably attainable.

The acute criteria have been determined to be met at 10% of the distance of the chronic mixing zone.

B. The concentration of and duration and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

The toxicity of pollutants is dependent upon the exposure, which is dependent upon the concentration and the time the organism is exposed to that concentration. The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration.

C. Comply with size restrictions.

The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.

9. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

Description of the Receiving Water

Effluent is discharged to a small, unnamed creek whose course has undoubtedly been reconfigured through numerous decades of agricultural practices and road construction in the area. The area's ground water table is elevated due to the proximity of the Yakima River to the south and possibly water leaking from the unlined Sunnyside Irrigation canal 1 mile to the north. A 1988 Groundwater Transmissivity Study prepared for the Buena wastewater facility project found that the water table near the treatment plant was 780 feet elevation above sea level, which is near the elevation of the receiving water. Given these facts, ground water drainage probably constitutes a significant fraction of the creek's flow on an annual basis.

The creek passes under Interstate Highway 82 a short distance from the outfall, and then flows into a natural flood channel in the Yakima River's flood plain. The flood channel courses approximately 3,000 meters towards the southeast to the confluence with the Yakima River at river mile 91.7.

The creek is designated, by default (Chapter 173-201A WAC), a Class A receiving water. Characteristic uses include water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Another nearby point source outfall is the Zillah POTW's outfall at Yakima River mile 89.6. Significant nearby non-point sources of pollutants include irrigated agriculture and livestock.

Water quality of this class shall meet or exceed the requirements of selected and essential uses.

Surface Water Quality Criteria

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, the U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below in Table 5.

Table 5: Surface Water Quality Criteria

Parameter	Criteria
Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Consideration of Surface Water Quality-Based Limits for Numeric Criteria

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and is defined as follows:

> The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of 25 percent of the critical flow in the unnamed waterway. The dilution factor also determined utilizing the ninety-fifth percentile of the effluent flow rate. The dilution factors for aquatic life have been determined to be: Acute 1.05 and Chronic 1.46 (see Appendix C for calculations).

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the unnamed ditch at the outfall location is the seven-day average low river flow with a recurrence interval of ten years (7Q10). The ambient background data used for this permit includes the data from receiving water studies performed by the Permittee in the past two permit cycles and is given in Table 6 below. However, these data were not collected according to the guidelines set forth in the State's *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (July 2004). This document sets forth the

methodologies and conditions required for an environmental study that meets the objective of the State's Water Quality Data Act (RCW 90.48.580).

Table 6: Available Ambient Data

Parameter	Value used
7Q10 low flow	0.25 cfs [a]
Temperature	22 ^{o} C [b]
pH (high)	7.7 [a]
Dissolved Oxygen	3.9 mg/L [a]
Total Ammonia-N	0.21 mg/L [a]
[a] 1994 to 1997 receiving water study by the Permittee	
[b] 2006 receiving water study by the Permittee	

BOD_5—Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD_5 was placed in the permit.

pH—The impact of pH was modeled using the calculations from EPA, 1988. The input variables were dilution factor 1.46, upstream temperature 22 ^{o}C, upstream pH 7.7, upstream alkalinity 65 (as mg $CaCO_3$/L), effluent temperature 23.6 ^{o}C, minimum effluent pH of 6.3, maximum effluent pH of 7.2, and effluent alkalinity 220 (as mg $CaCO_3$/L). Under these conditions there is no predicted violation of the Water Quality Standards for Surface Waters.

Temperature—Utilizing data from Table 6, there was a prediction of a violation of the temperature criteria for the receiving water. However, the receiving water temperature data available to the permit writer is outdated and does not meet the standards given in the State's Water Quality Data act for credible data set forth in RCW 90.48.580. Therefore, it is the Best Professional Judgment of the permit writer that the data is not of sufficient quality to base permit limits for temperature in the proposed permit. The Permittee is required in Condition S.8 of the proposed permit to collect background concentrations near the point of discharge. This information may result in a permit modification, limits, or a Schedule of Compliance in the following permit.

Fecal coliform—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a chronic dilution factor of 1.46.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for

those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

A reasonable potential analysis (see Appendix C) was conducted for ammonia to determine whether or not an effluent limitation for this pollutant would be required in this permit.

The determination of the reasonable potential for ammonia to exceed the water quality criteria was evaluated with procedures given in EPA (1991) at the critical condition. The critical condition in this case occurs July and August. The parameters used in the critical condition modeling (from Table 6 and Appendix C) are as follows: acute dilution factor 1.05, chronic dilution factor 1.46, receiving water temperature 22 ^{o}C, receiving water alkalinity 65 (as mg $CaCO_3$/L), and a background concentration of 0.21 mg/L ammonia. The reasonable potential determination as presented in Appendix C, revealed no potential to exceed water quality standards.

The existing permit contains an average monthly interim limit for ammonia of 3.1 mg/L. The receiving water data (used in the reasonable potential determination) are outdated and do not meet the standards given in the State's Water Quality Data act for credible data set forth in RCW 90.48.580. Therefore, the Permittee is required in Condition S.8 of the proposed permit to collect background concentrations near the point of discharge. The proposed permit retains the interim limit for ammonia of 3.1 mg/L, as a final limit for this permit cycle. At the time of the next permit renewal, the ammonia limit will be reexamined utilizing the newly acquired receiving water data.

Human Health

Washington’s water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JANUARY 24, 2001

Table 7: Comparison of Limits

Parameter	Existing Permit [a]				Proposed Permit			
	Average Monthly		Average Weekly		Average Monthly		Average Weekly	
BOD_5, in mg/L; lbs/day	30	30	45	45	30	30	45	45
TSS, in mg/L; lbs/day	30	30	45	45	30	30	45	45
Fecal Coliform Bacteria, in #colonies/100 mL	200		400		200		400	
Ammonia, in mg/L	3.1		No limit		3.1		No limit	
pH (standard units)	6.0 to 9.0				Same			
[a] Interim limits, existing permit's To Be Determined Limits were not issued.								

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994).

Also, the Permittee is required at the date of the next permit application, to submit a suite of effluent test data, since the WWTP has a design flow of greater than 0.1 MGD. Section 2B.6. of EPA form 3510-2A requires that a minimum of three pollutant scans be performed for Ammonia, Dissolved Oxygen, Total Kjeldahl Nitrogen, Nitrate Plus Nitrite Nitrogen, Oil and Grease, Phosphorus (Total), and TDS. This form also calls for chlorine testing; however the WWTP uses ultraviolet light to disinfect the effluent. Therefore chlorine testing is not required in the proposed permit. Therefore, the proposed permit requires three pollutant scans for these parameters be performed to fulfill the requirements of the application.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at Buena analyzes dissolved oxygen, conductivity, pH, which are internal process control parameters and are exempt from the accreditation requirement.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4. restricts the amount of flow.

The facility has been granted an exemption from the percent removal requirements given in WAC 173-221-040. This exemption is only in effect when infiltration and inflow remains below specified levels. Therefore, the permit requires that an annual Infiltration and Inflow report be submitted to the Department.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are

taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

The proposed permit requires that the O&M Manual be reviewed for compliance with Chapter 173-240 WAC. The Permittee is required to submit needed revisions, or an acknowledgment of review to the Department for its review and approval no later than **September 1, 2007**.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 173-308 WAC, "Biosolids Management". The management of other solid waste is regulated by local jurisdictional health departments through local ordinances and WAC 173-350 and WAC 173-351.

Septic pumpers are contracted by Yakima County to remove solids from the treatment system's recirculation tanks and septic tanks. The septic tank waste is delivered to a septage lagoon at the Cheyne Landfill for further treatment. These recirculation tank biosolids are land applied for soil nutrients at Yakima County's Cheyne Beneficial Use Facility. This facility is permitted by the Department of Ecology with additional oversight from Yakima County Health District.

The facility received coverage under the Statewide General Permit for Biosolids Management in April 2006.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system).

The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system". Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be

important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of its responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum based oils, or which result in toxic gases, are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

WATER QUALITY EVALUATION

The Department seeks to determine Buena's wastewater discharge compliance with the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S.8.of the proposed permit requires the Permittee to accurately determine the flow volume, pH, and temperature, in order to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary. Information about the dissolved oxygen content and nutrient status of the receiving water is also necessary to determine if the effluent discharge protects the dissolved oxygen content Water Quality Standard.

In 2004, Washington State promulgated the Water Quality Data Act (RCW 90.48.580). The law requires that data, meeting the credible data principles laid out in the law, shall be used for receiving water studies. The law states that:

(1) The department shall use credible information and literature for developing and reviewing a surface water quality standard or technical model used to establish a total maximum daily load for any surface water of the state.

(2) The department shall use credible data for the following actions after June 10, 2004:

(a) Determining whether any water of the state is to be placed on or removed from any section 303(d) list;

(b) Establishing a total maximum daily load for any surface water of the state; or

(c) Determining whether any surface water of the state is supporting its designated use or other classification.

The following principles need to be established to insure that water quality data are credible:

- appropriate quality assurance/quality control is followed and documented
- measurements are representative
- data sample size is adequate
- sampling and analyses are generally acceptable

Therefore, the proposed permit requires the Permittee to submit a Sampling and Analysis Plan to the Department for review and approval in order to assure that proper data collection methodologies are utilized during the study. The plan is required to adhere to procedures set forth in: *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*, 2004, Ecology Publ. No. 04-03-030. The Department will provide guidance as to what is required for the Evaluation during development of the Quality Assurance Project Plan , if necessary.

HYDROGEN SULFIDE EVALUATION AND MITIGATION REPORT

Inspections conducted by the Department at the treatment plant have revealed corrosion in the influent chamber which is likely caused by Hydrogen Sulfide gas. This corrosive gas has the potential to seriously degrade and shorten the lifespan of the treatment systems head-works. Therefore, the permit requires an evaluation of the Hydrogen Sulfide gas generation within their sewer system.

The Hydrogen Sulfide Evaluation is required to address the technological and/or Best Management Practices through which hydrogen sulfide generation may be reduced and identify methods to reduce the corrosion of the head-works equipment by the hydrogen sulfide. It also requires that achievements already made be delineated and requires the development of an implementation schedule for hydrogen sulfide reduction and mitigation.

Additionally, a mitigation report/schedule is required to be developed in accordance with the procedures outlined in Section G-2 of the Department's *Criteria for Sewage Works Design*, (December 1998) and the American Society of Civil Engineers' *Manual 69, Manual of Practice on Sulfide in Wastewater Collection and Treatment Systems*.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

American Society of Civil Engineers
1989. ASCE Manual 69, Manual of Practice on Sulfide in Wastewater Collection and Treatment Systems

Crites, R., and Tchobanoglous, G.
1998. Small and Decentralized Wastewater Management Systems. WCB/McGraw Hill, San Francisco, CA. p. 169-239.

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1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.
1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.
1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.
2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Ecology Publ. No. 04-03-030

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html)

1994. Permit Writer's Manual. Publication Number 92-109

1998. Criteria for Sewage Works Design, (December 1998) (http://www.ecy.wa.gov/pubs/9837/g2.pdf)

Washington State Department of Health.
2000. Recirculating Gravel Filter Systems: Recommended Standards and Guidance for Performance, Application, Design and Operation & Maintenance.

Water Pollution Control Federation.
1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.
1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department published a Public Notice of Draft (PNOD) on July 16, 2006, in the Yakima Herald Republic to inform the public that an application, draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30 day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105, or by writing to the address listed above.

The permit and accompanying fact sheet were prepared by James Leier**.**

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD5 – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining $CBOD_5$ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)

CALCULATIONS

		State Water Quality Standard		Max concentration at edge of...												
	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coefficient of Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
AMMONIA (critical conc)	210.0	9100	1800	841	664	NO	0.95	0.977	1109	0.79	0.70	127	0.79	1.05	1.46

CHRONIC DILUTION FACTOR AND TEMPERATURE CALCULATION

Qe -- Critical Condition Effluent flow (cubic feet second)	**Critical Condition Effluent Temperature °C**	**Qa -- Critical Condition Receiving Water flow (cubic feet second)**	**Critical Condition Receiving Water Temperature °C**	**Final Temperature °C**	**Chronic Dilution Factor @ 25% River Dilution [7Q10 Flow]**
0.1346089	23	0.0625	22	22.683	**1.46**

The chronic dilution factor was determined utilizing the volume fraction equation. The volume fraction equation is the simplest formulation of the dilution factor. It is defined here as:

$$DF = (Qe + Qa) / Qe$$

where: DF is the dilution factor; Qa is the volume flux of receiving (ambient) water [**for mixing zone analysis use 25% of ambient flow**] entrained in the plume from an outfall at some sampling point in the plume; and Qe is the volume flux of effluent in the plume.

APPENDIX D--RESPONSE TO COMMENTS

The following comments to the draft Buena STP NPDES permit were received from the Yakima County Public Services, Utility Section.

Comment #1: Page 13, Section S4.E. Infiltration and Inflow Evaluation. This section requires a plan to be developed to locate and correct inflow and infiltration if it increased by more than 15% from the previous year. Because our inflow and infiltration is relatively small, a 15% increase could amount to only 3 gallons per minute. We request that the permit be revised so that a plan to locate and correct inflow and infiltration is not required unless it is considered excessive based on EPA criteria, or the facility is overloaded. The table in Section S1.A provides language as to when infiltration and inflow is excessive (dry weather flows >120 gallons per capita per day and wet weather flows >275 gallons per capita per day).

Department's Response: The Department agrees that a 15% increase may present a less than significant increase in the total infiltration and inflow (I&I) flows to the POTW. Therefore, the permit's Section S4.E has been revised to state that an I&I Evaluation is required when effluent flows exceed 91 gallons per capita per day, on a monthly average. The second sentence in S4.E.2 has been revised in the following manner: "If a single month's effluent flow exceeds an average of 91 gallons per capita per day, the report shall contain a plan and a schedule for: (1) locating the sources of infiltration and inflow; and (2) correcting the problem."

Comment #2: Page 21, Section S8.A Sampling and Analysis Plan. This section requires a sampling plan to be developed for determining the receiving water's flow, temperature, pH, alkalinity, nitrogen, and phosphorous. We understand from talking to Ecology that some of these tests are needed to better the calculate the mixing zones. Others, such as nitrogen and phosphorous, are needed due to TMDL's that are being considered for the Yakima River. We request that you reconsider the tests described to see if any can be removed from the permit. The Buena system serves a very low income area, so any additional monitoring can have a significant impact on our rates and customers. The system was built about 13 years ago using 100% grant funds.

Department's Response: The Sampling and Analysis Plan for the receiving water study is required to ensure that the facility's discharge complies with Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington. Also, the federal Clean Water Act requires that pollution clean-up plans formulated in a Total Maximum Daily Load study impose waste load allocations on point sources discharging to a polluted water body. Therefore, the information gathered as a result of this sampling is needed to aid in determining the facility's potential wasteload allocation. The wasteload allocation assigned to the Buena STP as a result of a completed Water Clean Up Plan

(TMDL), may or may not result in more stringent permit limits in the future. Wasteload allocations are required to be based on high quality data, which is an objective of the Sampling and Analysis Plan.

Comment #3: Page 22, Section 29. Hydrogen Sulfide Evaluation and Mitigation Report. This section requires an evaluation to be done on the generation of hydrogen sulfide gas. Included with the evaluation is a mitigation report and schedule to reduce corrosion of the head-works due to hydrogen sulfide. We request that the report requirements be kept to a minimum or removed from the permit. We agree that something needs to be done to protect the head-works. However, the solution may be as simple as applying a protective coating. Other systems that treat septic tank effluent may have other ideas. Because the system has septic tanks at each home, and each tank is in an anaerobic process, it may not be practical to reduce hydrogen sulfide generation.

Department's Response: The Hydrogen Sulfide Evaluation and Mitigation Report is necessary to protect the public's investment in the Buena POTW infrastructure. It is the Department's intent that the Report should develop Best Management Practices that detail practical measures to prevent this corrosive pollutant from damaging components of the infrastructure. The Best Management Practices should be included as a new section in an updated O&M manual.